

prior art and the claimed invention; and (3) the level of ordinary skill in the art. See, e.g., *In re Mayne*, 41 USPQ2d 1451 (Fed. Cir. 1997).

Claim 1 defines a construction beam that is comprised of a tubular housing filled with a solid material. Claim 1 specifies that a Poisson's ratio of the tubular housing is less than the solid material to thereby confine the solid material. As described in the specification, in order to provide the confinement of the filler material 14, it is important that the Poisson's ratio of the tubular housing 12 is kept less than the filler material 14, which is particularly important for lateral confinement by the tube in the absence of pre-stressing. The increased strength of the tubular housing 12 depends on the fiber architecture and the thickness of the tube 12. The fiber architecture may be the direction of fiber and amount of fiber used to make the tube, etc. See, for example, page 6, lines 1-11. Indeed, the structural configuration of the tube to effect the claimed Poisson's ratio differences was an important discovery for enabling the construction beam to function properly in the absence of pre-stressing.

Since the Office Action in paragraph 2 does not even refer to any teaching or remote suggestion in any of the cited references with respect to the claimed Poisson's ratio, Applicant respectfully submits that the Office Action fails to set forth a *prima facie* case of obviousness. Applicant submits that for at least this reason, this rejection is misplaced.

Moreover, Applicant submits that the references of record lack at least the tubular housing set forth in claim 1 and claim 21. That is, Oliphant describes a reinforced concrete pole provided with an attachment mechanism for attachments to the pole. The

concrete pole is generally conventional in construction and thus lacks the claimed tubular housing forming part of a construction beam. Schwager describes a method for post-tensioning columns, wherein concrete columns are wound with an external cable to increase column performance for earthquake forces and the like. Schwager similarly lacks the claimed tubular housing of the construction beam. Moreover, the post-tensioning described in Schwager generally relates to post-tensioning the cable that is wrapped around the concrete column. Certainly, this structure is considerably distinct from that of the claimed invention. Finally, Welborn describes a method for pre-stressing concrete, wherein post-tensioning tendons 11-14 are coated with a concrete retardant to protect the tendons from bonding to the concrete so that after the concrete has cured, proper tensioning of the tendon can take place. See, for example, column 3, lines 31-73. Similar to Oliphant and Schwager, Welborn lacks the tubular housing forming part of the construction beam as claimed. Applicant thus respectfully submits that the rejection is misplaced.

Still further, none of the cited references even remotely appreciates a relationship of the Poisson's ratio of a tubular housing and solid material filling the tubular housing as claimed. As noted, the references of record lack the tubular housing of the construction beam as claimed, and its Poisson's ratio relative to a solid filling material is not pertinent to their respective constructions. For this reason also, Applicant respectfully submits that the rejection is misplaced.

With respect to dependent claims 2-13, Applicant submits that these claims are allowable at least by virtue of their dependency on an allowable independent claim. In

addition, claim 7 recites that the tubular housing is formed of a fiber reinforced polymer. Since the cited references lack the claimed tubular housing, this structure is also lacking in the art of record. Further specifications for the tubular housing are set forth in claim 12.

Reconsideration and withdrawal of the rejection are thus respectfully requested.

Claims 14-20 were rejected under 35 U.S.C. §103(a) over Oliphant in view of Welborn and Schwager. This rejection is respectfully traversed.

To the extent that claim 14 defines structure similar to that set forth in claim 1, Applicant respectfully submits that this rejection is misplaced for at least the reasons discussed above. Additionally, the construction beams formed of a tubular housing filled with the solid material and including the Poisson's ratio relationship as set forth in claim 14 enabled the construction of the claimed deck system including the construction beams secured side-to-side. Each of the references of record, in contrast, relates to a construction beam without any such tubular housing. It is well settled that "the mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 23 USPQ2d 1780 (Fed. Cir. 1992). Since the references of record generally relate to concrete structures without any such tubular housing, Applicant respectfully submits that the references lack even a remote suggestion and/or the desirability to either (1) include a tubular housing or (2) secure construction beams in a side-to-side relationship to construct a deck system. For at least this reason, Applicant respectfully submits that the rejection is misplaced.

The Office Action further contends that it would have been obvious to provide at least one transverse aperture "to provide the interconnection between tubular concrete structures." Since none of the cited references provides any teaching or suggestion of constructing a deck system by securing construction beams of the present invention side-to-side, however, the references similarly lack any suggestion to interconnect such structures. Claim 16 further recites that at least one reinforcing bar is secured in the transverse channel under tension to provide a transverse post-stress in the deck system. This structure is similarly lacking in the references of record.

With respect to claim 17, claim 17 has been amended to clarify that the tubular housing forms a part of the construction beam. As noted above with respect to claim 1, the references of record lack any teaching or suggestion of the claimed tubular housing as well as the claimed relationship of the Poisson's ratio of the tubular housing and solid material therein. In paragraph 4, the Office Action contends that "the using of a Poisson's formula [sic] to obtain the ratio of the tubular housing is less than the solid material, since it have been held that discovering an optimum value of a result effective variable involves only routine skill in the art." As noted, Oliphant, Welborn and Schwager, however, are silent with respect to any such Poisson's ratio of the materials used for constructing the concrete beams. Moreover, since the references of record lack the claimed tubular housing, a Poisson's ratio is irrelevant to their disclosed constructions. Indeed, although silent in each of the references, it is likely that the concrete beams are formed using conventional concrete beam forming methods. Reconsideration and withdrawal of the rejection are thus respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the application in condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Prompt passage to issuance is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the claim by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

17. (Amended) A method of forming a construction beam comprising filling a tubular housing with a solid material, the tubular housing forming a part of the construction beam, wherein a Poisson's ratio of the tubular housing is less than the solid material to thereby confine the solid material.